# Greetings

The State of Texas is gifted with a far-flung 62,000-mile system of highways that has been called the best in the Nation — the result of many years of sound planning, efficient administration, and dedicated effort by the Texas Highway Department.

In spite of the fine quality of Texas highways, increasing travel can make them obsolete if we do not continue our expansion program. The State's population has increased by one-fourth since 1950. The number of motor vehicles is growing faster than the population and now stands at more than five million; and the miles traveled by these vehicles total a staggering 43 billion a year.

A concentrated program of highway construction and modernization has in the past several years helped bring about a heartening reduction of more than 19 per cent in the fatality rate on all Federal and State highways in Texas. Research has shown that when obsolete highways are rebuilt and improved to standards adequate for present traffic, the fatality rate will drop by as much as 50 per cent.

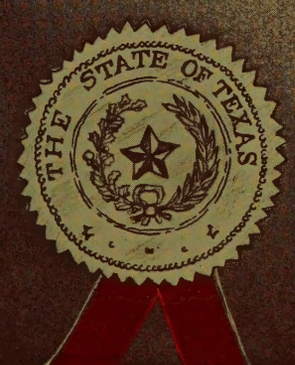
Yet 11,000 miles of primary highways in Texas are already obsolete for the loads of traffic they carry, and the Texas Highway Department warns that the fatality rate could begin to rise rather than continue its drop on this section.

Texas leads the Nation in miles of highways under construction and completed during the last five years. Direct benefits to the highway user of the construction of adequate highways have been estimated at three times their cost.

THEREFORE, I, as Governor of Texas, do hereby designate the period of May 20-26, 1962, as

**Highway Week**

in Texas and urge appropriate observance and special attention directed to the needs of our highway system.




Texas Highways May 1962

# Texas Highways

Volume 9 • Number 5

May, 1962

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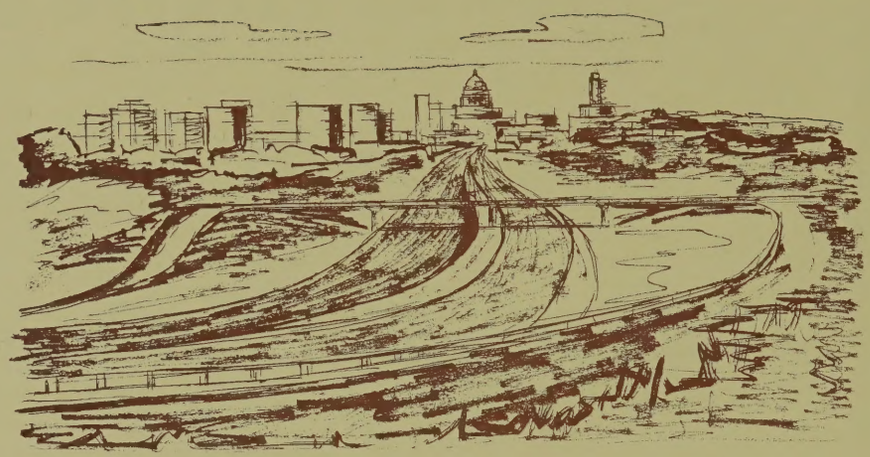


## Editorial

The Texas Highway Department this month is squarely in the spotlight. Throughout the length and breadth of the state, millions of Texans are taking a keen and searching look at the public agency which builds and maintains their highways. The reason: May 20-26 is National Highway Week.

Highway Week is a time when the Department should put its best foot forward from a public relations standpoint. At no other time in the year are so many citizens aware of the roads they use; at no other time is such concentrated public attention focused on the Department itself.

The relative success and long-range effect of Highway Week will be measured in the amount of genuine friendliness and cooperation offered the public in each contact with the Highway Department.

Essentially, the role of the Highway Department in this special Week is that of a guest. It would not be proper for a public agency to beat its own drum. But much is being done in our behalf by private citizens who know the value of good roads and want to keep on using them. The Texas Good Roads Association is their public spokesman.

Yet while we will be guests during Highway Week, the paradox is that we will also be hosts. The welcome mat is out: most District Offices will hold a one-day Open House during Highway Week. The doors of the Highway Department will be open to all who wish to see, and be reassured, that Texas is getting an honest dollar's worth of good highway for every tax dollar expended.

The theme of Highway Week this year is, "The Road Ahead." Whether the road ahead is smooth and straight, or rough and troubled, depends a good deal on how well each employee of the Department conducts himself in the presence of the taxpaying public—not only during Highway Week, but during the other 51 weeks of the year as well.

Let's put on our best "public relations" hat during Highway Week—and keep on wearing it.

MAY 20-26
HIGHWAY WEEK

## HIGHWAY WEEK - 1962

Never have so many eyes been focused so intently on the road ahead in Texas.

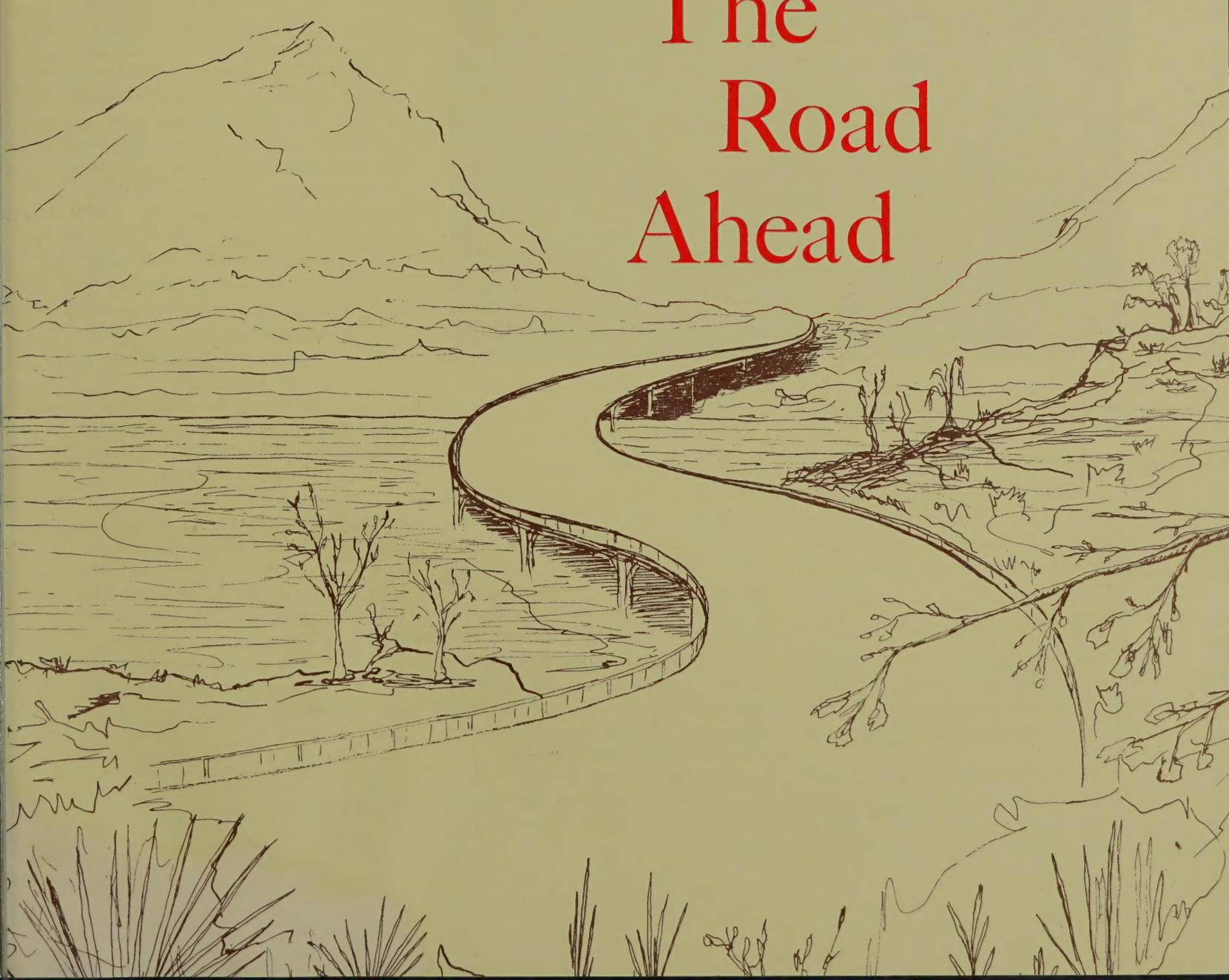
Millions of Texans are pausing this month to take a long, reflective look at their highways—and at their Highway Department. "The Road Ahead" is the theme of Texas' version of the second annual National Highway Week, May 20-26. Texans are hearing the highway story on the radio, watching it on television, reading it in the newspaper, and listening to it in the company of their friends.

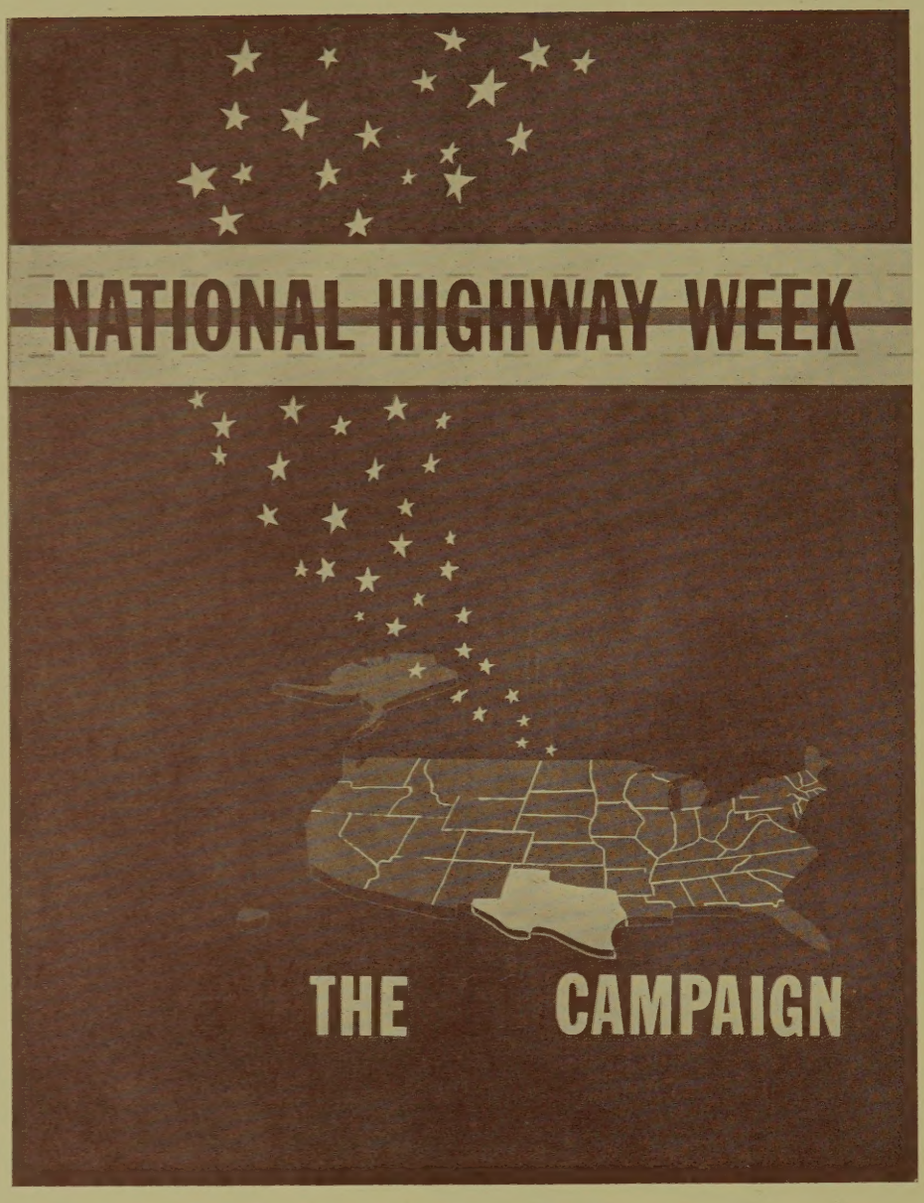
### WHAT IS HIGHWAY WEEK?

Highway Week is a special occasion designed to focus public attention on the most overlooked but widely used service of daily life, the modern highway. Its purpose is to tell the highway story to the public—not merely a story of accomplishments, but of future needs as well, with the objective of rallying public support behind the goal of better highways.

The special Week was originated

# The Road Ahead






last year by the American Association of State Highway Officials and the Better Highways Information Foundation, a nonprofit organization formed to publicize the cause of good roads.

## HIGHWAY WEEK—TEXAS STYLE

In Texas, supporters of good roads have joined hands under the banner of the Texas Good Roads Association to throw the spotlight on Highway Week.

The T.G.R.A. is sponsoring a series of eye-catching and attention-getting events and activities under the theme, "The Road Ahead." The message of Highway Week, spread far and wide with the generous help of public service-minded members of the Texas press, radio, and television will place emphasis more on tomorrow than today.

Distilled to its essence, the "road ahead" theme expresses disturbed concern about the future of Texas in highway transportation. While Texas' current high-quality highway system is noted with pride, T.G.R.A. points out that today's pride may be replaced with tomorrow's frustration, and offers these unsettling facts as documentation:

— Texas population has increased by one-fourth since 1950. There are now more than 9½ million Texans and by 1970 there will be at least 11 million, according to some projections.

— The number of motor vehicles is growing faster than the population, having increased a startling 56 per cent in the 1950-1960 decade. There are now approximately five million motor vehicles and Texas is adding them at a giant-sized pace of one million every four years.

— Vehicle miles traveled are skyrocketing at a fantastic rate, and the figure now stands at a staggering 43 billion annually (an increase of 60 per cent since 1950). Projections indicate that in 1970 this figure will have grown to at least 64 billion vehicle miles traveled each year—ironically indeed, the "64 billion-mile question."

What do all these figures add up to? The T.G.R.A. believes, and is earnestly saying so during Highway Week, that they add up to the "most terrific traffic jam in history" if Texas highway capacity cannot keep pace with these increases in travel.

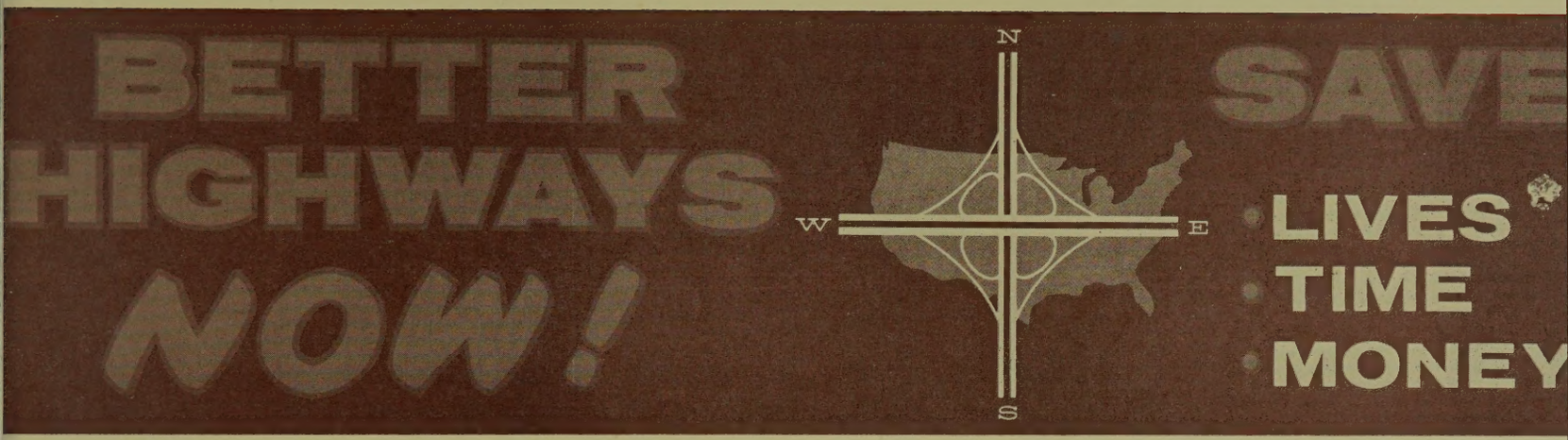
If this traffic jam takes place, T.G.R.A. states further that it will exact an appalling cost in human lives lost on the highway, and at the cost of large-scale economic stagnation throughout the state.

The only way to avoid this situation is to have a continued long-range program of highway construction, improvement, and modernization to meet changing traffic needs.

That, in sum, is the message of Highway Week 1962 as exemplified by the "road ahead" theme. It is being carried to the public by means of this program sponsored by the Good Roads Association:

- The Texas Highway Commission will appear before public-spirited organizations in different areas of the state. Individually and collectively, the Highway Commissioners will spearhead the spreading of the Highway Week story.

MAY 20-26
HIGHWAY WEEK




• A motion picture has been produced for use on television and will be shown by nineteen television stations throughout the state during Highway Week, thus reaching millions of Texans through this mass communications media. Entitled "The Road Ahead," this fifteen-minute public-service film was produced by the T.G.R.A. in cooperation with the Highway Department. The film tells the story of Texas highways from 1917 to the present, and poses the highway problems set forth earlier in this article.

• T.G.R.A. is sponsoring an essay contest open to all senior students in Texas high schools to stimulate more interest in highways among the students, teachers, and parents across Texas. The subject: "What Better Highways Mean to my Community." A total of $400 in scholarship prizes is being offered, with the three prize winners to be announced during Highway Week and many other entrants to receive Honorable Mention Certificates.

• The assistance of Texas newspapers, radio, and television stations has been enlisted to spread the word about good roads. Feature articles and editorials will appear in substantial number and variety in the press just before and during Highway Week, while the broadcast media will carry public-service announcements. Many trade journals and highway-industry publications will also devote appropriate space to Highway Week.

• Ribbon-cutting ceremonies will be held on many sections of highways completed near or during Highway Week, with sponsorship and participation by local civic groups.

• Proclamation of Highway Week has been made by the Governor and numerous mayors in Texas towns and cities.

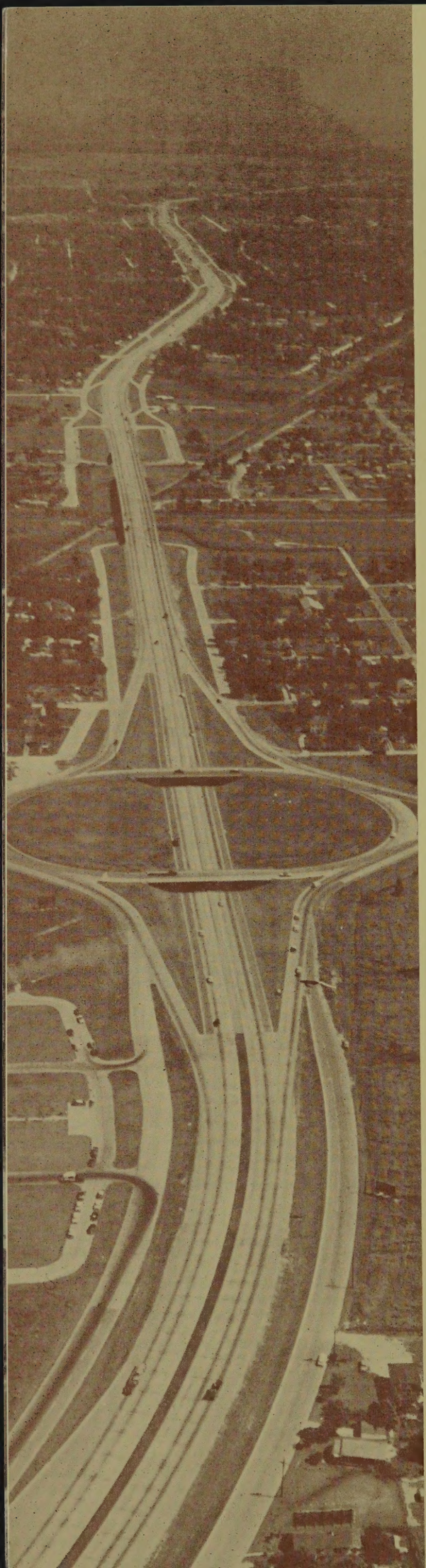
• The Texas Highway Department will hold Open House in each of the 25 District Offices and the Houston Urban Project Office on one day during Highway Week, with specific details announced locally. The public will be shown how the Highway Department operates on a normal working day, with special emphasis on the unique features of Department shops and laboratories.

Through this Highway-Week program, the attention of the state's citizens will be directed to the highways they use and to the agency which is responsible for those highways.

All eyes are on the road ahead.

The following Texas television stations will carry the public-service film, "The Road Ahead," during Highway Week. The film was produced by the Texas Good Roads Association in cooperation with the Texas Highway Department. Specific times when the film will be used can be obtained by contacting the local station on or after May 15.

| | | | |
|---|---|---|---|
| Abilene | KRBC-TV | Houston | KPRC-TV |
| Amarillo | KFDA-TV | Lubbock | KCBD-TV |
| Austin | KTBC-TV | Odessa | KOSA-TV |
| Beaumont | KBMT-TV | San Antonio | WOAI-TV |
| Harlingen | KGBT-TV | San Angelo | KCTV-TV |
| Corpus Christi | KXTV-TV | Texarkana | KTAL-TV |
| Dallas | WFAA-TV | Temple | KCEN-TV |
| Fort Worth | WBAP-TV | Tyler | KLTV-TV |
| El Paso | KROD-TV | Wichita Falls | KFDX-TV |
| | | Waco | KWTX-TV |



# the long road to Today

Dogs barked, horses reared in fright, and people watched openmouthed in astonishment. The whole town of Terrell, Texas, turned out to witness the sight.

The first horseless carriage ever seen in the State of Texas was passing through the streets of Terrell. Neither the startled onlookers nor Colonel E. H. Green—who had bought the automobile and was riding in it—realized they were watching a significant turning point in the history of Texas highways.

Nor did the residents of nearby Dallas, whom Col. Green visited in his newfangled contraption. "Hon. E. H. Green . . . created a sensation in this city last night," reported the DALLAS NEWS of October 6, 1899. "At 7:30 o'clock he rode up and down Main Street in a horseless carriage at the rate of fifteen miles an hour. Nothing that has passed along the streets of Dallas since the parade of the Kalifs has attracted greater attention.

"Accompanied by a gentleman who is an expert in handling these vehicles, Mr. Green left Terrell in his new possession yeterday afternoon at 2:20 o'clock for Dallas, more than thirty miles away.

"Near Forney, they were crowded off the roadway into a gully by a farm wagon and the water tank was damaged so that it began to leak and a stop was necessary in order to make repairs.

"Mr. Green arrived in Dallas at 7:30 o'clock, having made the trip in five hours and ten minutes. He related his experience last night as follows:

" 'When we left Terrell, we struck a very sandy stretch of road, and because of the dust thrown up by the vehicle we had to go very slowly. After this bad stretch was passed we turned on more power and fairly flew.

" 'It was amusing to notice the sensation our appearance caused along the road. Cotton pickers dropped their sacks and ran wildly to the fences to see the strange sight. And the interest was shared by the farm

animals too. One razorback sow that caught sight of us is running yet I know. At least a dozen horses executed fancy waltz steps on their hind legs as we sped silently by, and but for the fact that we went so soon out of sight, there would have been several first-class runaways. . . .' "

The story of Col. Green is an oft-told tale, but it is the story of highway development in Texas. Col. Green did much more than frighten a few horses. He introduced a new method of transportation in Texas which had a greater effect on the state's highways than any event before it and pointed the way toward the eventual founding of the Texas Highway Department in 1917.

Until the coming of the horseless carriage, Texas highways had developed in slow, piecemeal fashion. The state's roads—many of them descended from trails made by early settlers and cattlemen, or from paths blazed by gold-seeking Spanish conquistadores —were in poor shape when Col. Green made his epochal trip to Dallas.

During that "Gay Nineties" period virtually all roads were impassable after spells of bad weather. Many country roads were almost imaginary to begin with. An account in an 1896 San Antonio newspaper read: "The roads are now in such a poor condition and car tracks at the street crossings are so high that one physician has broken five singletrees of his carriage in the past few days."

Such was the situation when the automobile came into the state. The discomforts of painfully slow travel over primitive roads had been endured before by men and horses, but not by the adventurous drivers of the new horseless carriages. The number of automobile owners following Col. Green grew quickly and cried out for relief as they jounced and jolted over the bumpy, disconnected collection of ruts then serving as roadways.

Because of frequent extremely muddy conditions, many farmers had a profitable side business going by keeping a team of mules handy to pull motorists through the mire. Price: $1.

***One-way bridges, once a vital part of main thoroughfares, have been relegated to isolated Farm to Market roads. These bridges, built by the counties, were inherited by the Department as the roads were incorporated into the Highway system.***

A few instances are known in which farmers, by means of their own ingenuity, kept sections of the road in a perpetual state of mud month after month. Some found this activity more profitable than farming. In later years, after formation of the Texas Highway Department, teams were maintained in certain areas for free assistance to motorists.

In this early stage of highway development, it behooved a motorist to get in a rut and stay there. On one stretch of road between Austin and Fredericksburg, there was at one time only a single set of ruts in dry weather. If one driver met another approaching from the opposite direction, it was usually a matter of much discussion and finally a tossup to see who would leave the rut, permitting the other to pass.

The far-ranging automobile drivers were not satisfied within county limits. They pushed their contraptions from city to city, lopping off time and distance at a pace unmatched in the history of the state. The advantage of good highways in stimulating business growth had long been recognized, and the distance-covering feats of the automobiles brought the situation to a boil. The public began to demand a true all-weather system of connecting highways controlled by a central state agency. After several abortive attempts, the Texas Legislature established the Texas Highway Department in 1917 to work with the counties in solving the roads problem.

Ten men formed the entire staff of the new Department when it opened offices in a wing of the State Capitol. They were faced with building a state-wide organization from the ground up. In the early days of its

***This early road in Victoria County shows evidence of travel over it in spite of its nightmare quality.***

*In the young days of highways, it paid to find a rut, get in it, and stay in it.*

*Signing has improved too.*

existence the Department's most valuable property was a state of mind—a determination that statistics, slide rule, pick, shovel, sweat, and purpose should join the unending distances of Texas with smooth, safe highways.

Today, where great diesel-driven bulldozers, scrapers, and haulers push and mold the ground swiftly and easily, mule-drawn equipment once plodded day after day. The work was slow and difficult. Scrapers and blade graders, wagons and hand labor with picks, shovels, and wheelbarrows—this was the equipment that built the Department's first roads.

*Some years ago, highway building was an exciting and dangerous game, with not everyone welcoming the advent of the road.*

Even as it had benefited the enterprising farmers, mud was the Texas Highway Department's biggest headache. Originally highways were located whenever possible along divides to save the cost of drainage structures. Stream crossings were made at points used by wagon teams, and later timber bridges were constructed over larger streams.

There were culverts of wood, rock, or galvanized iron on smaller streams. Most structures were subject to periodic overflowing.

As the youthful Highway Department got underway, it was required to build roads to withstand near-Arctic snowstorms in the Panhandle or subtropical humidity on the lower Gulf Coast. It had to build roads through snake-infested swamps and through deserts of shifting sand. Engineers were delving into problems entirely new in content and consequence. It was a period of intense learning and experimentation. A division of the Department was created to do nothing but study new techniques and materials used in highway construction and maintenance.

The Texas highway system has grown in three distinct eras: 1917-1930, when basic Texas cities were linked by all-weather highways; 1940-1949, when attention was focused on construction of safety features on highways and farm-to-market road construction; and 1954 to the present date, as effort is devoted to providing sufficient controlled-access expressway mileage to handle the state's heavy traffic.

### 1917 - 1930

This first era brought the centralization of highway responsibilities in state rather than county government. Road-building efforts were directed to connecting Texas cities and regions with all-weather highways. This problem was compounded by the vast distances of Texas, to which some anonymous motorist paid mournful tribute in the symbolic sonnet:

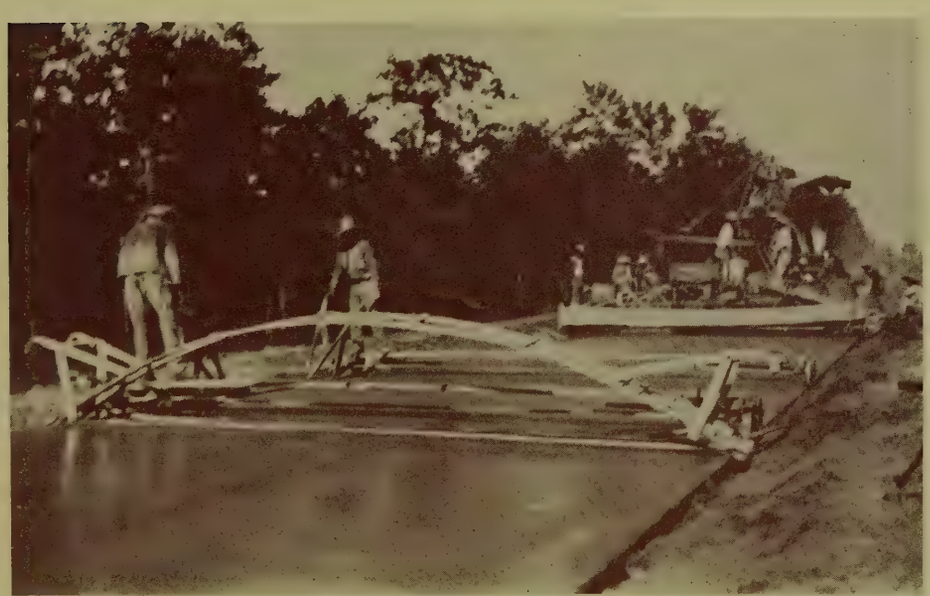
*"The sun has riz,*
*The sun has set.*
*And here we is,*
*In Texas yet."*

***There may not have been toll fees, but there were fees for being extracted from the mud.***

The Highway Department constructed its first highway slightly more than a year after its founding, a twenty-mile stretch between Falfurrias and Encino, and pressed on until 1930 when Texas cities were joined by good roads. As a result of this program distance ceased to be measured by the automobile driver in how many flats he had to fix, how many times he had to use low gear, or how many times he got stuck in the mud. Distances were reduced simply to miles and the time necessary to travel them.

### 1940 - 1949

Growing traffic in a growing state had outmoded many highways, making necessary an era of construction focused on safety features, bridges, roadside parks, and widening of roads.



***Somewhere in the state, on August 6, 1928, this picture was made. Workers are putting down concrete pavement using the hand screed method.***

Included in the safety campaign was an overhauling of the highway-signs system. In the beginning there were no signs to direct traffic. Travelers simply had to stop and ask. The first highway markings were strips around utility poles. Signs lacked uniformity and were often small, crudely fashioned, and hard to read. All this was changed and modern signs installed.

During this era highway planners also set about providing an economical hard-surfaced road which would enable farmers and ranchers to bring their products to market the year round. Many of these farm-to-market roads were built.

### 1954 -?

The current era of road building is devoted to providing high-volume facilities for heavily concentrated traffic. Today the Texas Highway Department is a part of the most gigantic road-building era the nation has ever known.

The express highway, symbol of the future, is no longer confined to the city but is being pushed across the state. The Interstate Highway System under construction jointly by federal and state highway agencies is destined when completed to become a monument to our generation, making it

***Gone are the spindly, small-time roads of yesterday. Replacing them are today's monstrosities of steel, concrete, and asphalt which incorporate safety features into every grade and curve.***

possible for a motorist to travel from coast to coast and border to border without stopping.

The Texas Highway Department has grown in size along with the highway system it has built. There are seventeen divisions in the State Highway Building and at Camp R. M. Hubbard in Austin carrying on the work of the headquarters of the Department. The state is divided into 25 highway districts with each comprised of approximately ten counties. An example of the changing times is the Houston Urban Project office, which handles the complex expressway systems of the state's largest metropolitan area. The Urban Project Engineer-Manager is the equivalent of a District Engineer or Division Head.

At the peak of the Highway Department is the State Highway Engineer, who bears responsibility for the work of all districts and divisions. The present State Highway Engineer is Dewitt C. Greer, who has held this post since 1940. Greer in turn is responsible to the Texas Highway Commission, a policy-making governing board composed of three members appointed by

***Equipment has also been modernized with the passing years. This "Best 60" tractor pulls a Russell twelve-foot grader to clear snow.***

***Today's modern safeways are planned for the motorists' pleasure. Divided highways are accepted procedure.***

the Governor of the State. Each member's term runs six years with one member's term expiring every two years. This vacancy every two years is filled by an appointee of the incumbent Governor.

Decades of brainwork and sweat, plus a billion dollars, have gone into the Texas Highway System. From a humble beginning, the System has been built into the thousands of miles of gleaming ribbon which today inspire the motorist's prayer: That the highways in Heaven will be as good as those in Texas.

With the well-earned respect of the people of Texas, and with a half-century of experience, the Texas Highway Department will continue steering motorists safely and swiftly through the outposts, villages, and metropolitan cities in Texas. Two lines from the pen of Van Dyke could be used to sum up the past and future of the Department:

*"Follow and honour what the past has gained,*
*And forward still, that more may be attained."*

***This old Ford Model A served as an asphalt distributor—was bought between 1930 and 1935.***

James H. Aiken

Thomas C. Collier

# New D. E. Named

The appointment of James H. Aiken as District Engineer of District 9 at Waco, replacing Thomas C. Collier, has been announced by State Highway Engineer D. C. Greer.

Aiken, presently Assistant District Engineer in the Waco District, has 30 years service with the Highway Department.

Collier is retiring from the Department after almost 35 years.

"It is with sincere regret that we announce the resignation and retirement from the service of the Texas Highway Department of Mr. Collier," Greer said. "He will continue his interest in the development of Texas highways as he enters upon his new responsibilities with private industry in an allied field."

Collier's resignation became effective April 8, and Aiken began his new duties the following day.

A native of Salado, Aiken, 53, was graduated from Texas A&M College in 1931 with a degree in civil engineering.

He began his employment with the Texas Highway Department as an Instrumentman in Bell County. Aiken has worked in almost every capacity, including Resident Engineer, District Construction Engineer, Expressway Engineer, and Assistant District Engineer.

Aiken has served as Assistant District Engineer in Waco since 1954. He served overseas with the U. S. Corps of Engineers during World War II, and was discharged as a captain.

Collier has served in many engineering assignments from Draftsman to Resident Engineer, to Assistant District Engineer, Engineer of Road Design, and Assistant State Highway Engineer, Greer said. Collier has been District Engineer at Waco for the past nine years.

# TEXAS HIGHWAYS: 2000 A.D.

These views on the future come from past issues of Texas Highways

As man takes his first cautious steps into space in the early 1960's, made possible by a series of technological "breakthroughs" wilder than the dreams of many a science-fiction writer, evidence is also accumulating that man may be about to score more breakthroughs on a different level—the good old earth.

We are seemingly on the verge of major advances in private transportation, including highway travel.

We now stand on the threshold of the most far-reaching travel revolution in thousands of years—a revolution in which new power sources, new modes of travel, and the wonders of automation will make it possible to traverse the world in complete safety at dazzling speeds.

Ever since the momentous discovery of the wheel about 2,500 B.C. during the Bronze Age, man has been groping with the problem of private transportation. Yet he has made less progress in this field than in almost any other. The "wheel vehicle," a type of chariot, was developed 4,500 years ago as a personal conveyance. Man has added many refinements for comfort and appearance, and has substituted the internal combustion engine for the animal, but actually he is still using a form of the ancient wheel vehicle his ancestors developed 45 centuries ago.

The covered wagons which spanned the North American continent probably moved no faster than the horse-drawn Roman chariots in the days of Julius Caesar. The stumbling block for so many centuries was the animal—old Dobbin could go no faster. That hurdle was cleared when man freed himself from animal power and harnessed the internal combustion engine to his needs. Even so, he added only about 30 miles per hour to his speed.

The modern automobile, developed during the same half-century which saw the rise of the airplane, has not enjoyed the fantastic advances in speed of airborne vehicles. In fact, man seems to have reached his capacity for speed utilizing the present mode of transportation for private use. The current maximum speed limits have been enforced since 1941. During the last two decades, society has felt that man is not capable of safely traveling faster than 60 miles per hour. These restrictions were imposed in spite of the fact that science and industry have continued to improve both the vehicle and the roadway. Today's automobile costs twice as much, is twice as big, and is capable

***Today's freeway is four-or-more-lane, divided, with frontage roads.***

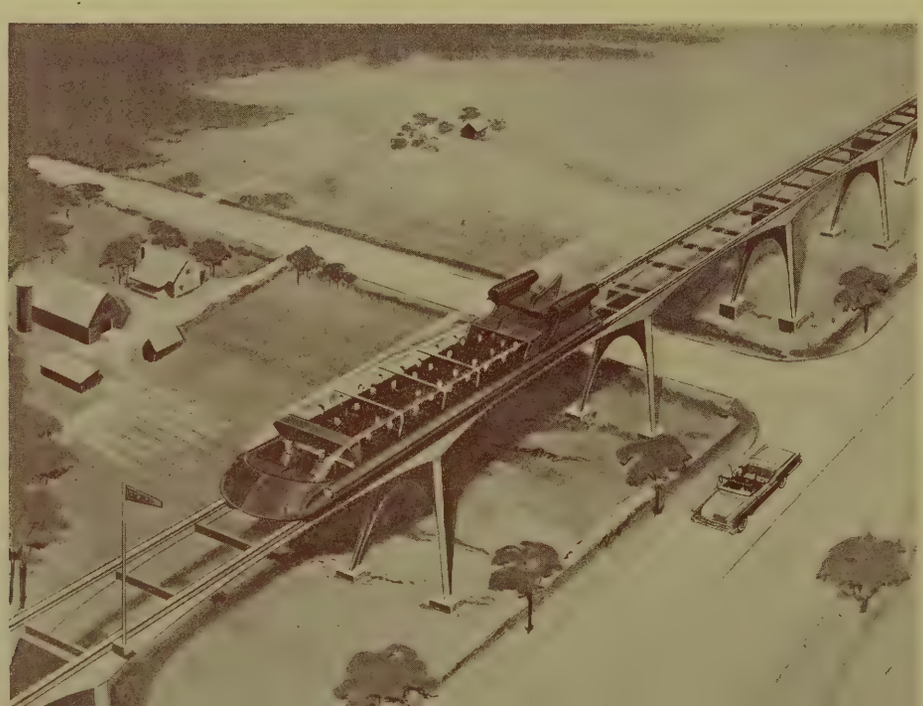
of traveling twice as fast. The roads are twice as good and three times as safe. But man still travels no faster than he did two decades ago.

Man's age-old itch to see what is over the next hill, compounded in this complex business world by the frequent necessity to be in several places on the same day, has reached epidemic proportions. It has now become necessary for mankind to criss-cross the planet on which he lives at tremendous speeds and with a maximum of safety.

Ironically, the biggest obstacle yet to be removed before man can break his sluggard's chains in travel is man himself. Human vision and reflexes are not equal to the task of traveling safely at the great speeds in store for the future.

Automation is thought to be the answer. The next logical development is to eliminate the human driver and replace him with machines which can function efficiently at several times human-reaction speed. The skeptics of yesteryear said old Dobbin would never be replaced by a mechanical gadget, but the horseless carriage took over for all time. The skeptics of today might say that the human driver will never be replaced by a mechanical gadget, but this turnabout is almost upon us—today man is almost obsolete as a competent driver. Successful experiments have already been conducted with automatically piloted vehicles.

Linking today with tomorrow, the electronic highway will be the forerunner of more radical developments. The vehicles of 2,000 A.D. and after will be drastically different, our engineers predict. The internal combustion engine will become obsolete. So may the wheeled vehicle, after 4,500 years of steady use.



Vehicles of tomorrow will use electric motors or electric energy transmitted by radio. Atomic energy will power the larger, heavier transports. Even the sun may be harnessed to drive a solar-powered vehicle. Instead of wheels, vehicles of the future may ride on rails or on a soft blanket of compressed air a few inches above the earth.

Will man still use highways as a primary means of getting places—or will our roadway system become as obsolete as the horse-drawn vehicle? During some 5,000 years of recorded history, overland travel has been almost

***The best of yesterday was two-lane, no shoulder—no extras.***

entirely by highway. But in spite of the awesome developments expected in transportation, engineers do not expect highways to become obsolete in the foreseeable future. Some feel they will be more important than ever.

Travel in the future will be marked by the emergence of a multitude of automatic safety devices which will consign today's high-accident rate to the dust of bad memories.

Automatic pilots on vehicles of the future will free the driver to indulge in uninterrupted conversation, watch car-borne television, or simply lean back and enjoy scenic highways—if vehicle speeds aren't so high as to whisk him through the countryside too fast to see anything.

Other safety devices predicted include:

Mirrors and/or electronically actuated warning signals will be used on the approaches to blind spots where hill crests or curvature obscures the view of approaching traffic.

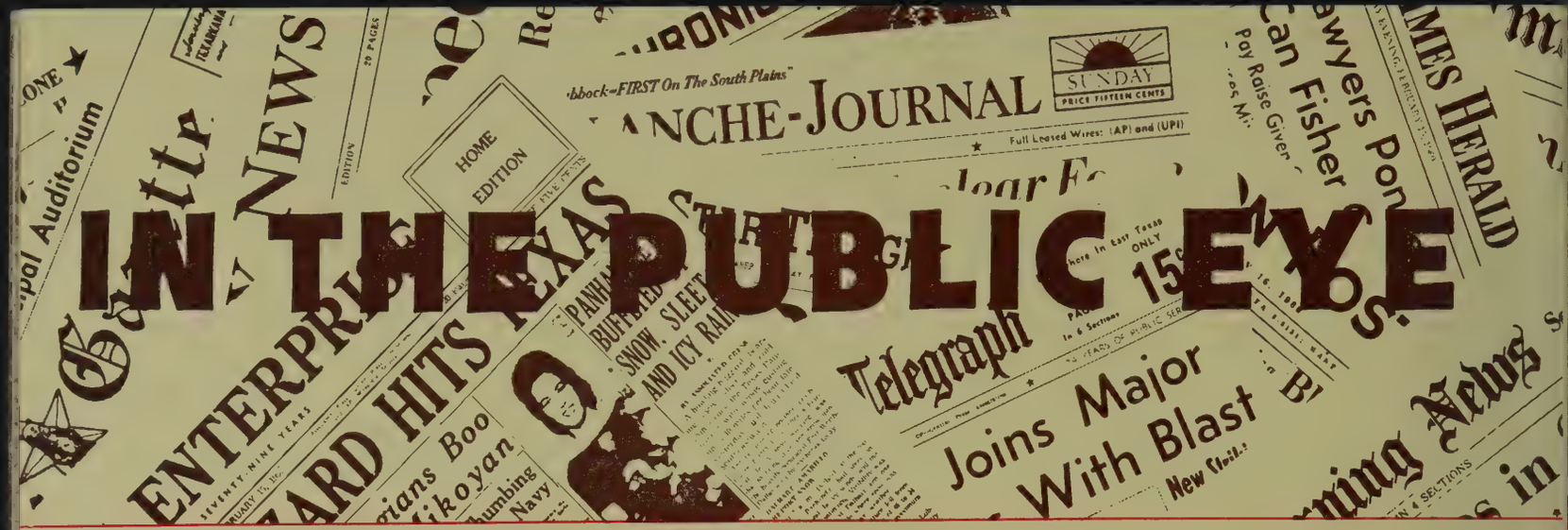
Radar or photoelectric cells sensitive to infrared rays emitted by engine heat of approaching vehicles could be used for protection while driving in foggy or other forms of inclement weather (the so-called "radar braking" included here).

Directional high-frequency radio waves used in traffic enforcement could stop either a single vehicle or groups of vehicles by electronic disruption of the ignition systems.

Predictions of tremendous progress in highway construction are being made. The universal concept of building public roads has made slow progress through history. From the time of the Great Appian Way built by the Romans in 312 B.C., little improvement was made until the Scotsman, McAdam, gave the world a new road-building idea in the macadam road some two hundred years ago.

The future holds the promise of great strides in both materials and construction. While the cost of building highways may never get cheaper, it will be vastly easier to build them.

Texas highways in the year 2,000 will be part of a complex, fast-paced travel world filled with remarkable machines invented to do faster and better the things man once did himself.




## A COSTLY ISSUE

**Stephenville Daily Empire,** reporting remarks by Roy Rodman to the Lions Club on vandalism and litter—"Rodman [Supervising Landscape Architect, Austin Office] said that last year the cost to the state agency for cleaning up and hauling off litter from the highways totaled $1,343,974. The average highway sign has to be replaced every two years because of vandalism and last year the state agency spent $385,886 to replace signs, Rodman said.

"Rodman said a number of suggestions have been made to the highway agency that the penalty for throwing litter on the highways be painted on highway signs. The speaker said that was done in one county as an experiment but the savings in that county was not enough to pay for painting the signs."

## PINCH PENNIES

**Conroe Courier,** editorially rehashing corruption in the highway program—"Texas is fortunate not to be included in this scandal and we hope the contractors and people having a part in this great highway program will do their job as it should be done and to try and save the taxpayer a few bucks here and there instead of trying to enrich themselves as the contractors in other states have done."

## IT'S FOR REAL

**Houston Chronicle,** describing a traffic light on Farm Road 1093 (Westheimer Road) about 40 miles west of Houston—"Suddenly, in the midst of this rural setting, an urban monstrosity blinks at you. It's a traffic light—seemingly lost from its natural municipal setting.

"It's no mirage. The traffic light keeps motorists from meeting halfway across the one-lane bridge that spans the Brazos River near Simonton. There's a light on each end. A treadle in the road turns the light red at the far end of the bridge until your car crosses. The treadle on the other end makes it green again for cars from either direction."

## FREE(WAY) PARKING

**Austin Statesman,** datelined Houston—"[Wayne] Derryberry, 32, landed his single engine plane on a freeway in southwest Houston Saturday night when a fog suddenly covered the area.

"Derryberry landed with the traffic—in the right lane. He parked overnight on the freeway's grass esplanade and took off yesterday.

"He spotted the lights of a big shopping center and knew there was a freeway nearby, he said. He also saw two cars on the freeway.

"'I put down about 500 yards in front of the first car,' he said. 'He stopped and flagged traffic for me.'"

## IN HALF

**Amarillo Daily News,** via Associated Press from Dallas—"Modern highways with new safety features can slash the fatal accident rate in half, state highway engineer D. C. Greer told the Governor's Conference today.

"Greer said the Highway Department has completed a two-year study of 1,500 miles of roads before and after modernization."

## THE CHANGING FACE

**Austin American,** with "Good News" from San Marcos—"Bulldozers by the bunches are rapidly changing the face of this city crowned by a college.

"The 'dozers are gouging out the broad path for the Interstate 35 freeway which already has San Marcos flanked on the north and south. . . . Old-timers won't know their town.

"One of the big changes will be the passing of the famous 'Circle' which has caused many a traveler a moment of panic. A modern interchange will take its place."

## MORE AND MORE

**Grand Prairie Texan,** examining the Dallas-Fort Worth Turnpike—"The turnpike, which embodied the latest engineering advances in its construction, has had steadily increasing traffic volume every year since it was opened in August 1957. . . .

"When bonds are retired, the turnpike will be turned over to the Texas Highway Department for toll-free operation. Retirement of the $58,500,000 in revenue bonds which made possible the turnpike, was begun in January with $335,000 worth being bought on the open market."

## NO COMMENT

**Houston Press,** saying—"The State Highway Department will not discuss the city's plans for parking lots under downtown elevated freeways until the new traffic arteries [for Highway 90] are built."

## PAVING THE WAY

**Daily Standard Times** (San Angelo), noting—"The United States is making available $2 million toward the cost of an engineering survey in the jungles of Panama and Columbia. It looks toward paving the way for completion of the Pan American Highway, a project that has considerable interest in Texas."

**Corpus Christi Times,** editorially explaining Texas' interest in the above—"The Pan American Highway is a unique international undertaking for peaceful and constructive purposes.

"Completion of the Pan American Highway will make Texas the crossroads for overland traffic between North America and Central and South America. Certainly that is a prospect which South Texas particularly can look forward to with enthusiasm."

## THE SIGNBOARD QUESTION

**County Wide News** (Littlefield), on billboard advertising—"Is it to the advantage of the people in this community to prohibit the use of roadside advertising. . . . Does it add to the pleasure, comfort, or safety of travellers on the highway to deny them information on where they can eat or buy gas or stop for the night or find needed service for their cars?

"We don't think so. . . ."

## A PERPETUAL PROBLEM

**Austin American,** on suburban development—"The Texas Highway Commission discusses the gray-area problem at almost every meeting, and points out that it costs the state in actual miles of roads and highways, even while the suburban developments are creating demand for more roads and streets and highways.

"The Highway Commission encourages the early purchase of highway rights of way where locations can be determined, before development creates heavy damage and extra cost situations. But when outer development skips large tracts to create the gray areas, the state—or the county—when called on to buy the right of way for a future traffic system, finds the cost has ballooned. . . ."

## IT WILL COME

**Farmersville Times,** bemoaning a population loss—"There have been complaints that we're just a little bit too far removed from the Dallas-Fort Worth complex. Perhaps we are right now, but Dallas and Garland continue to spread out all over creation, and with the upcoming reconstruction of State Highway 78 giving us an even speedier route to Big D, possible growth has not been removed, it is merely being detained—if we take advantage of our opportunities."

## GOOD MEN

**Waco News-Tribune,** discussing the appointment of Jim Aiken to succeed Tom Collier as that area's district engineer—"In Jim Aiken, the Texas Highway Department named the man who next to Tom Collier knows this part of the state better than any other, the man who as Collier's right bower has engineered all our recent highways and farm-market road improvements, the man who knows what is due to happen next in this vital transportation program. It is a clear signal that the schedule of construction will go forward without delay, a welcome signal to all citizens interested in Texas progress."

## ONE OR THE OTHER

**Memphis Democrat,** announcing that—"A State Highway Department engineer said today it may put a 'car proof' barrier down the middle of a section of West Freeway plagued by fatal headon collisions.

"One [plan] calls for a steel cable similar to that used on sections of the toll road to keep cars from crossing the island. The other calls for steel posts imbedded in concrete."

## FULL STEAM AHEAD

**Laredo Times,** by a staff writer—"Seventy-seven percent completion on the big expressway project in North Laredo is reported by Senior Resident Engineer Arthur C. Volz, in charge of the State Highway Engineers office in Laredo. The contractor is ahead of schedule."

**Daily Standard Times** (San Angelo), on construction progress—"Several highway projects around San Angelo are progressing rapidly, and the Texas Highway Department is getting set to start others."

## OPTIMISTIC OUTLOOK

**Wichita Falls Record-News,** telling readers—"Enough right-of-way for a $45 million highway program along U.S. Highway 287 in Wichita and Wilbarger counties already is available, Wichita District highway engineer L. B. Dean told members of the chamber of commerce highway committee Friday morning.

" 'If we had the funds, and we hope to get them as soon as possible, we could spend at least $45 million on the highway with right-of-way already obtained in these two counties,' he said. . . ."

## CONFIRMATION

**Victoria Advocate,** from Port Lavaca—"The State Highway Engineers confirmed a 1962 Calhoun County highway program totalling $2,325,000 here Thursday."

## STEPCHILD HIGHWAYS

**Memphis Democrat,** on a 10-year improvement plan for Highway 287 from Fort Worth and Dallas to Amarillo—"The Highway Department studies indicate that about $43 million ought to be spent on improving U. S. 287 over the next 10 years or so.

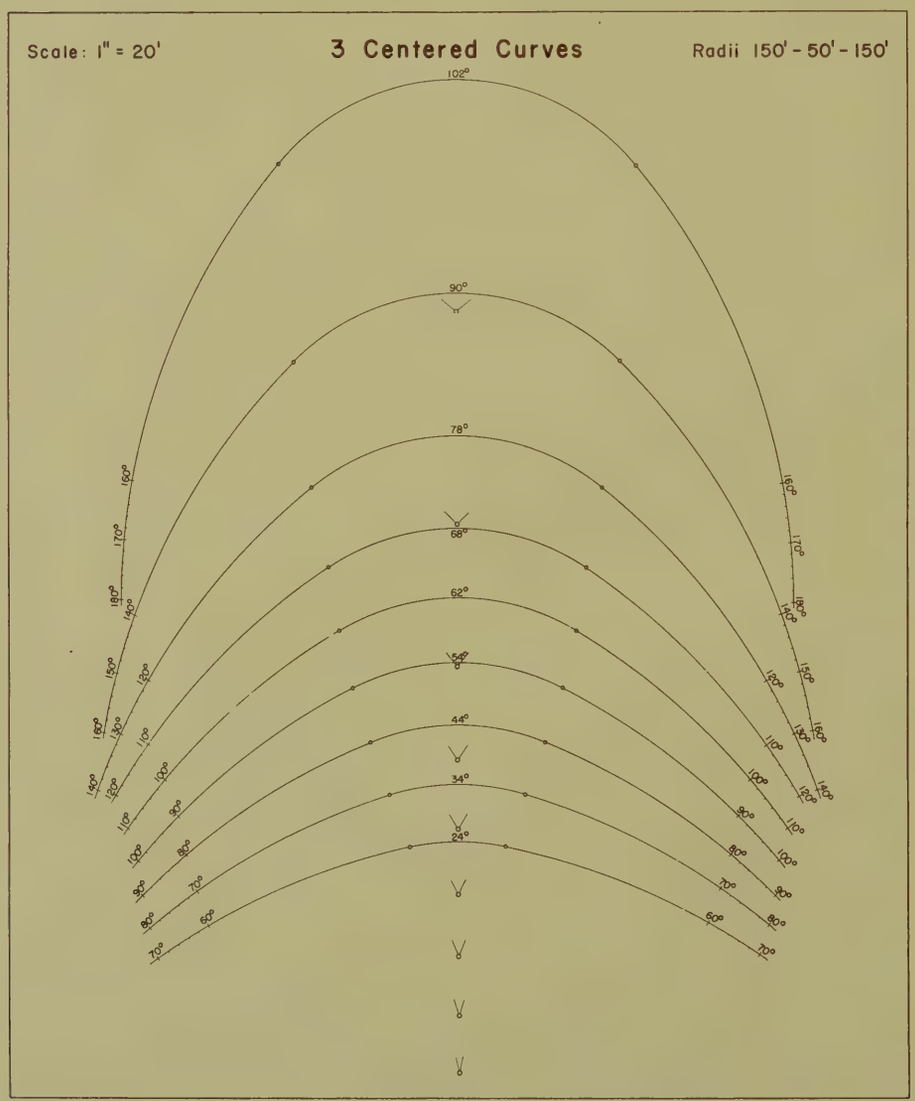
". . . engineers and planners are viewing the need of a divided four-lane facility all the way.

"Meeting this need hinges on a solution to the statewide problem of updating about 22,000 miles of 'Stepchild' highways."

# Modern Tools Available to the Engineer*

The tools I will mention here are not tools in the true sense of the word, but talent and aids available from the Austin Office—particularly in the Highway Design Division, D-8; the Bridge Division, D-5, and the Operations Division, D-21.

Several years ago, when the Interstate Program was accelerated, we in the Austin Expressway Office went to D-8 for a means to keep pace without overloading our payroll with personnel. They came up with the answer of photogrammetry. The Photogrammetry Section of D-8 helped us write specifications and let two contracts for projects. The contractors supplied us with planimetric and topographic sheets as well as original cross-sections on punched cards which the Computer Section of D-21 listed in an easy-to-handle form.




**Centered curves.**

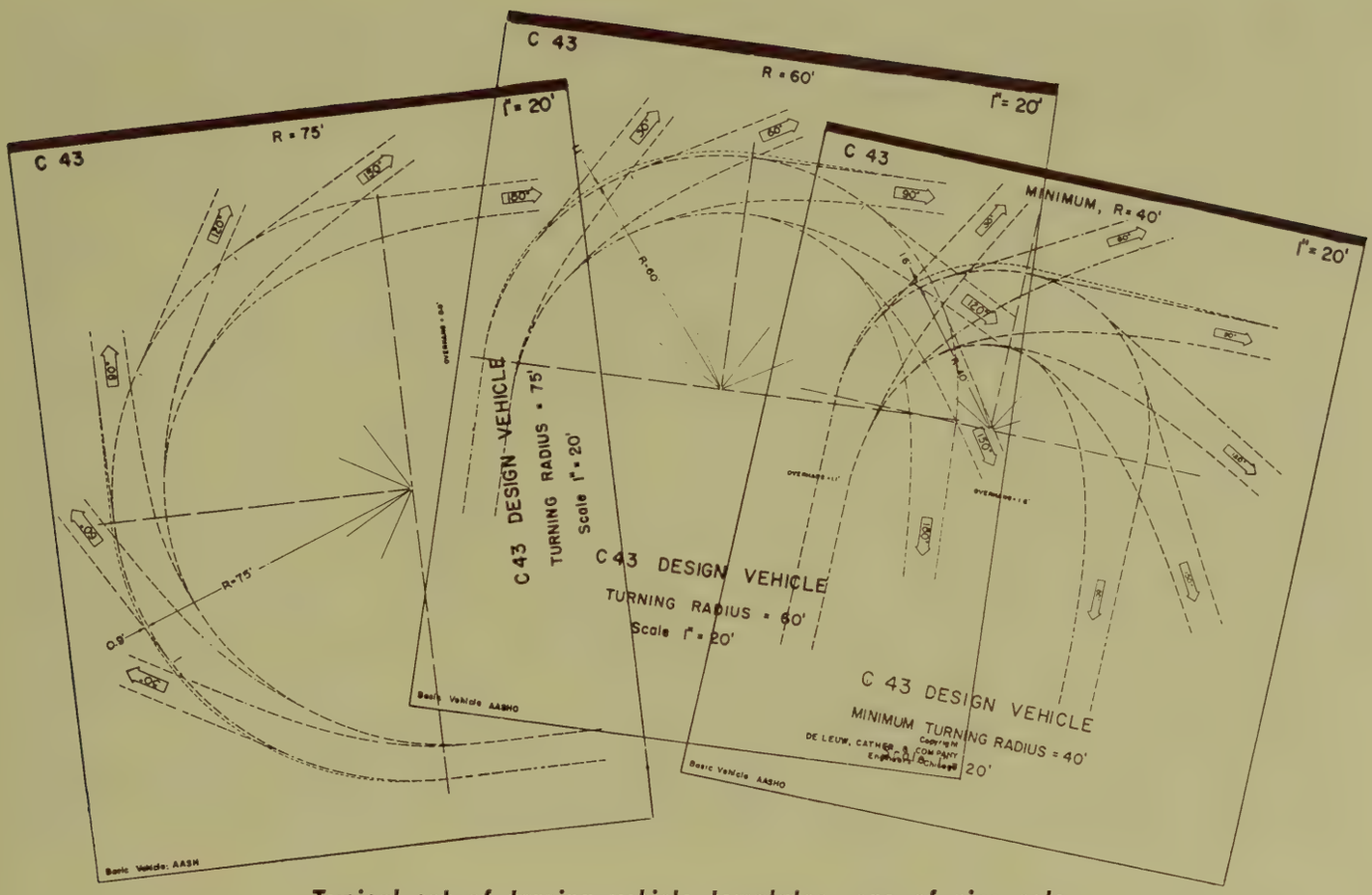
The planimetric sheets were used in the development of schematics submitted to the Bureau of Public Roads and public hearings. Subsequently, the planimetric and topographic sheets greatly aided the development of the right of way plans, and the construction plans. The detail on these sheets is far above anything we have had to work with previously.

The D-8 Photogrammetry Section has grown since their first aid to the Austin Expressway Office. The section now has several Kelsh Stereoplotters and will soon become the proud owner and operator of a Microtape unit. This unit is designed to measure long distances accurately in a relatively short time. Also, the Photogrammetry Section has been responsible for a new *Photogrammetry Manual* which is available to the field at this time.

The Highway Design Division has been responsible for making available to the Districts the "Turning Templates" and the pamphlet *Templates For Turning Paths of Design Vehicles,* copyright 1958 by DeLeuw, Cather & Company, Consulting Engineers. These templates have shown us the reason for those unsightly black tire marks on our curbs and channelizing medians used in at-grade intersections. In fact, these turning templates have been such a success in the development of our geometrics that in our spare time we have developed a set of three-centered curve templates similar to those described in another pamphlet distributed by D-8, *Developing Tools and Techniques for Geometric Design of Highways* by Jack E. Leisch, Chief Highway Engineer of the DeLeuw, Cather & Company. Should we find these three-centered curve tem-

*Presented at the 36th Annual Short Course

MAY 20-26
HIGHWAY
WEEK




***Typical set of turning vehicle templates—one of nine sets representing three vehicle types and three different scales.***

plates to be successful in the development of our geometrics, the negatives for the templates will be turned over to D-8 for distribution to the Districts.

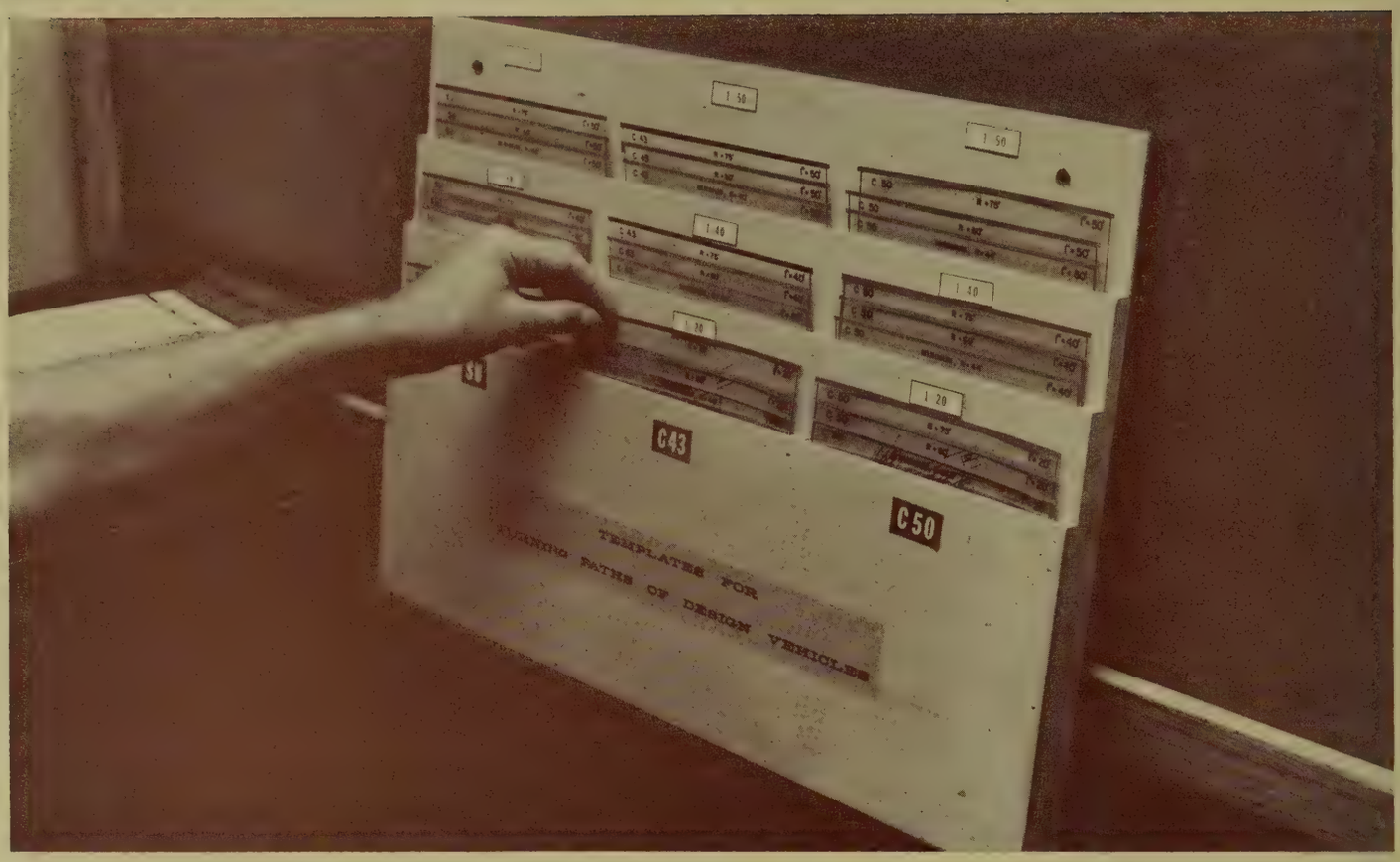
Though not used directly by the Austin Expressway Office, the Geology Section of D-8 has assisted our District Laboratory Engineer in supplying him with soil maps and the like. These have aided in soil explorations for the quantities of base materials required on our multilane sections.

The Bridge Division has loaned the talents of its Operations Section to the Austin Expressway Office many times in supplying standard sheets and the solution of peculiar hydraulic problems. The Operations Section of D-5 is preparing a much-needed *Hydraulic Manual* which should be available in the near future.

Considerable assistance has been given by the Design Section of D-5. Here again standard sheets and aid in solving problems we had not previously encountered are supplied by the talent of the Design Section. This section, with the cooperation of the Computer Section of D-21, has developed many programs to aid in bridge design and geometrics. An Interoffice Memorandum dated December 14, 1961, from Clyde Silvus has attached computer-program descriptions of output listings. These programs have been of much aid to us in the design of our structures and the geometrics of our interchanges.

The geometric programs B-11 and B-11A are triangulation programs which were developed by the Computer Section and Robert L. Lewis, Supervising Designing Engineer, D-8. An excellent description of these programs is available from Lewis, *Horizontal Control Staking by Triangulation with Computations By the IBM 650 Computer.* This paper was presented at the 41st Annual Meeting of the Highway Research Board, and describes the method of horizontal control used on the project in downtown Austin that is nearing completion.

The Operations Division, D-21, has been a mainstay in the operation of the Austin Expressway Office. The Computer Section of this Division has been responsible for the saving of untold man-hours of computation resulting in more details available in our plans and to our construction personnel. The multilane earthwork program is considered to be largely responsible for time saved both in the office and the field. The computer handles the mile-after-mile job of typical cross section while our office personnel continues to plot the cross sections of our interchanges—the quantities in the interchanges being inserted in the quantity listing. This quantity listing is in such a form that station




***Templates for turning paths of design vehicles in wall rack.***

quantities are easily transcribed to the plan-profile sheet, then proofread, and the mass diagram simply plotted and checked. The listing "Differences in Elevation at Edges of Crown," made available to our contractors and field personnel, is a great aid in roughing in the frontage roads since, generally speaking, the profile is very near original ground. A crew with this listing can lath out a frontage road with no need of an instrument.

The listing of "Construction Staking Data" is supplied our contractors and field personnel. This listing gives each reference hub elevation and distance from the reference line, then in turn under an assigned title the distance from the reference hub and either an elevation for use with a direct reading rod or a cut or fill for use with the Philadelphia rod to each break point in the cross section. All of this information is in a form fairly easily handled without any man-hours involved in transcribing or calculation by field personnel. We have received much favorable comment on these listings from our contractors.

The Reproduction Section of D-21 has been of considerable aid in cutting down drafting time. This section can do some really amazing things. The schematics mentioned earlier are an excellent example. The Reproduction Section reduced our planimetric sheets from a scale of 1 inch equals 40 feet to 1 inch equals 100 feet, put a profile section on them, and made a continuous roll that appears as regular plan-profile paper. We had to put the border on it. To develop our right of way plans, the Reproduction Section reduced the 1 inch equals 40 feet planimetric sheets to 1 inch equals 50 feet on a standard plan sheet. This time we didn't even have to draw the border. In the case of standard sheets, the section supplies us with a Cronaflex positive and we eradicate any minor objectionable notes and ink directly on the positive the corrections. Where there are large areas of a standard we want to change, Reproduction will shoot an intermediate negative and we opaque the areas not wanted, then the positive is made and inking is completed.

These are just a few of the tools and aids available to the field through the Austin office. It is not contended that they will solve all of our problems. We, as supervisors, have a responsibility to the younger engineers—to give them the benefit of our engineering knowledge and to see that they make use of the modern tools available.

These tools are here to stay and the more we make use of them, the more confidence we will gain. The personnel of the Divisions are most happy to be of assistance, but they are not mind readers or magicians. If you have a problem and believe that one of these sections can aid in its solution, you have to let someone know. These sections have personnel available that will come to the district upon request to give assistance. It is highly recommended that you give them all a try.

MAY 20-26
HIGHWAY WEEK

# РУССКИЕ ШОССЕ*

"Highways are happy ways when they lead the way to home" could well be the theme song of the American traveler after a motor tour in the Soviet Union.

Texans traveling in Russia report that conditions are rather binding as compared to the wide-open friendliness of the Lone Star State. In Russia, the driving tourist has certain routes marked for him. Entries and exits of the cities are also limited. Only a few cities are open to the auto traveler.

A guide to highway travel in the Soviet Union says: "There are more than 4,000 miles of highway travel open, available and *permitted* to the traveler by car."

Texas, with an area 32 times smaller than that of the Soviet, has fifteen times as many miles of highway open to tourists.

Texas visitors enter the state from any direction on one of dozens of state and federal highways. To enter Russia, however, the motorist must have detailed plans approved by the Soviet government, who knows where he is at all times.

Restrictions are placed on visitors to Russia by Intourist, the official agency that handles all arrangements for travelers to the country. The services of Intourist are mandatory and must be exactly predetermined, confirmed, and prepaid in advance of arrival in the USSR.

As a motoring visitor, you may travel only in certain cities—including Moscow, Stalingrad, Leningrad, and Kiev. You stop all night only in cities designated by Intourist. In compari-

***It isn't upside down or backwards. It's a typical road sign on the Moscow-Simferopol highway, one of the most traveled routes in the Soviet Union.***

*Russian Highways.

son, the Texas traveler stops wherever they hang out the "Vacancy" sign.

Motorists drive on the right-hand side of the road in Russia as they do in Texas (most of the time, that is), but the horn-honker is more restricted. The Russian map says, "The horn may be used only on highways outside the cities and then only as a warning to prevent accidents or collisions."

The speed limit in Soviet towns and cities is 60 kilometers, or 37 miles per hour, which is just a little faster than the 30 mph limit in most Texas cities.

Road markings present a real difference. For example, the exclamation mark is the sign for danger. A picture of a train means a rail crossing. A picture of a car means "no automobile traffic," and a motorcycle, "no motorcycle traffic." A black trumpet on a yellow background tells the motorist "no horn blowing."

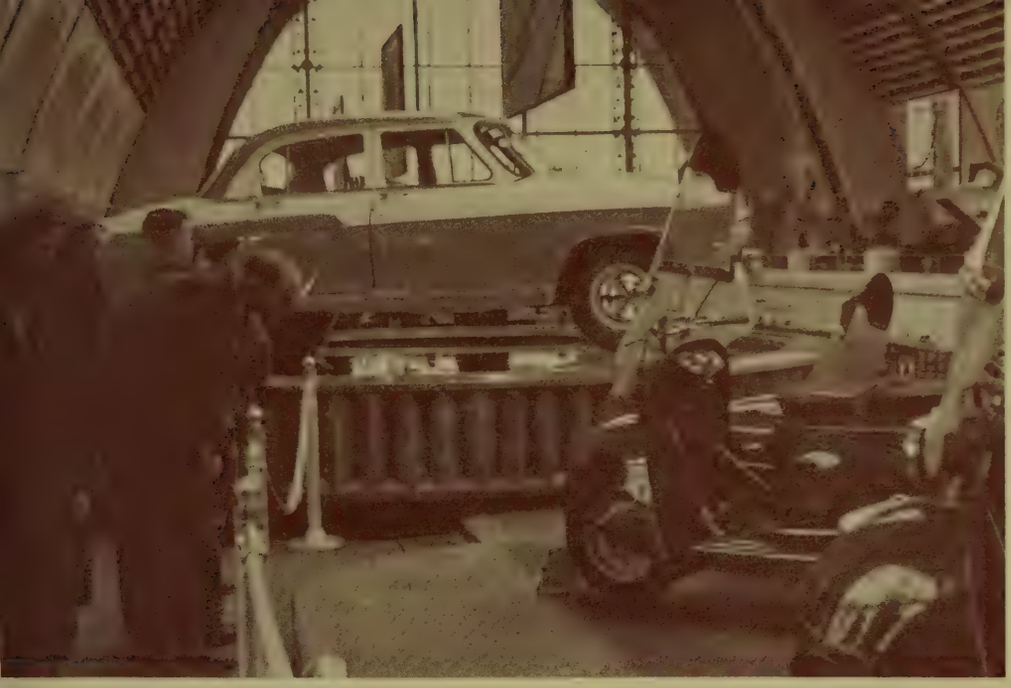
Automobile expenses vary considerably in Russia as compared to those in Texas. The highest octane gasoline in Russia is 1.45 rubles per litre, or 55 cents per gallon. Other grades range from 28 to 41 cents. Premium gasoline prices change rather rapidly in the Lone Star State because of competition, but generally run no higher than 35 cents per gallon.

A car wash in Russia is 52 cents, compared to Texas where a wash is generally $1.50 to $2.

A seven-man team of U. S. highway experts made a tour of Russian highways last fall and concluded that the USSR lags behind the U. S. in highway design, construction, and research, but that the country's road system is entirely adequate for its needs. (You don't need highways if you don't have a car.)

The team reported that the typical

***These Russian road signs are provided the prospective motoring tourist on an official travel map. There are only about 4,000 miles open to tourist travel.***



***This 75-horsepower Volga is the Russian medium-priced automobile, selling for about $5,000.***

intercity highway is a two-lane asphalt road with dirt shoulders and satisfactory grade and alignment. The road accommodates from 1,000 to 4,000 vehicles a day, depending on location.

In comparing the United States transportation facilities with those of Russia, one U. S. Congressman said, "To get in Russia's shape, we would have to abandon fourteen out of every fifteen miles of highway and destroy nineteen out of every twenty autos and trucks."

For years Russia has poured money into heavy industrial growth, neglecting transportation. Until 1959, the important cities of Kiev and Odessa were not linked by a single paved road. The whole Soviet Union had only 146,000 miles of all-weather roads at the end of 1958. Only 36,000 miles were paved with asphalt or concrete.

The Soviets are not building and do not have anything on the drawing boards similar to our Interstate Highway System. There seems to be no need for such a system because there are only five million vehicles in the country. The United States has 76 million registered vehicles. Texas alone has more than Russia—5,106,000.

Three and a half million of the five million Russian vehicles are trucks. The other one and a half million automobiles are concentrated mainly in the cities and are mostly taxis and government-owned cars.

Visiting engineers report that at last the Soviet is moving to build up their transportation system. Muscovites only recently got their first glimpse of the cloverleaf interchange. Moscow, a city of seven million, is now being ringed with seven loops. The seventh of the loops is a four-lane divided facility with controlled access designed to accommodate 20,000 to 25,000 vehicles daily. It is 62 miles long and is scheduled for completion this year.

The U. S. survey team said construction methods in Russia are generally more unsatisfactory than those used in the United States. Soviet road builders do not do enough heavy rolling of fills and bases. Portland cement sealing is a problem, and they use harsh concrete mixes.

By American standards, the road-building equipment is underpowered. Mixes are hauled in side-dump, non-agitator trucks. Central mixing plants are so far from job sites that many times mixes begin to harden before reaching the work area.

Buying a car in Russia would also prove unsatisfactory to Texans. A citizen who is qualified to own a car must pass through many months of training, quizzing, and waiting for the wonderful day when he can be the proud owner of an automobile.

An applicant for a driver's license must take 50 hours of instruction to learn how to make minor repairs. This

***Moscow citizens gather around new American car. Soldier in the foreground told the people not to stand around looking at the "Capitalist" car, but they ignored him.***

***Typical gasoline station in Moscow. There are about sixteen of these modern structures in a city of seven million. Nearly all cars are owned by the state and filled at their home base—much like official Highway vehicles.***

includes fourteen hours of written and oral exercises and one hour of operating a heavy truck.

He must be at least seventeen and a half years old and have completed the tenth grade of school or have a substantial job. He also must have a passport, a medical examination, present two photos, and show that he is able to pay for the driver's test.

If you were a citizen of the "People's Paradise" and wanted to buy a car, you would have to sign the book at the state automobile store. If you are a Muscovite, you have only one outlet for cars. The waiting list has about 60,000 would-be car owners on it. This backlog is more than the Communist motor industry produces in several years. Despite domestic shortages, Russia continues to export about 20 per cent of its passenger-car output.

If and when your name reaches the top of the list, you must report to the precinct police station. You show the police your dwelling occupation license, your work permit, and Moscow zone-identification pass. Your fingerprints are matched with those on the police file. You sign an oath that you do not own a car because it is against the law in the USSR for an ordinary buyer to own two cars. After a little more swearing and red tape, you are given permission to purchase a car.

You pay the money for the car, but you only get a receipt. Next comes a visit from the police. If your story is cleared by them your receipt is stamped.

Then your wait begins. This waiting period generally runs to another year. When the day arrives, you take your papers back to the police and swear that everything you have told them is true. You also swear you will not sell the auto for at least three years. This is to prevent your turning around and selling it on the black market. Of course, if you are ever accused of deviation, your precious possession will be confiscated.

One of the most popular medium-priced autos on Soviet highways is the little Moskvitch, which costs about $2,750. The car's engine is about the size of one of our low-priced cars of about twenty years ago. It has porous sponge rubber sheets under the floor mat to keep out the cold because it has no heater.

No radio, either.

As a matter of fact, no private cars have radios in the Soviet Union. You might tour off someplace and tune in a foreign broadcast.

And Big Brother never feels that just watching you is enough. He likes to "hear" over you too!

# The Department's Role in Emergency Programs

Since the most ancient of days, highways have played an important role in the shaping of history by either hampering or helping the movement of men and materials. At no time has this movement seemed more important than today, with the threat of nuclear attack.

However, there have been many examples through the years which emphasize the necessity for good highways. Perhaps the classic example, according to military men, is the German attempt to invade Russia during World War II. Then, poor roads combined with rough winter weather—snow, slosh, cold, and rain—to almost completely immobilize transportation of German troops, machinery, equipment, and supplies.

Our very own country has dealt with dire road conditions in countless areas, including Cambodia, New Guinea, Laos, Vietnam, and, of course, Korea. Contending with the cowtrails existing in most of these areas, trails which are either filled with dust during the dry season or ruined by mud —that worst of all enemies to military movements—during rainy periods, has only made many more appreciative of the fine highway network widespread throughout the United States.

The practicality and necessity of such a network has long been recognized by the Texas Highway Department. To assure the safe and swift flow of traffic at all times, the Department has implemented a procedure to be followed in time of emergency.

According to *Highway Highlights,* published by the National Highway Users Conference in Washington, D. C., "Highways also have the day-in, day-out role of helping to make possible the swift, safe, and sure transport of our military men, missiles, and other strategic materials. No wonder the 41,000-mile system that links all our important cities and crisscrosses our country was renamed in 1956, the National System of Interstate and Defense Highways. No wonder our defense needs carry 30 per cent weight in the determination of the new route locations on this system."

This Interstate network will ease transportation problems facing the Department during domestic disaster and nuclear attack in carrying out emergency operations designed to expeditiously move essential traffic. This is the primary function of the Highway Department during disaster, as outlined by the Texas Operational Survival Plan.

The Department will perform its functions within the Engineering Services Section of the State Survival

***While three other Nike-Hercules stand ready on their launchers, another soars skyward. It is to keep the Armed Forces supplied with equipment—such as missiles and other supplies—that our Texas highways are so vital to the defense of our nation.***

Plan. This emergency organization consists of professional personnel from the Highway Department, other state agencies, Bureau of Public Roads, public utilities, contractors in the field of construction and maintenance, professional engineering organizations, and state engineering schools. Appointed chief of the organization is State Highway Engineer D. C. Greer.

Aiding the State Highway Engineer from the Texas Highway Department is a staff from the Austin office and 25 districts. Acting as alternate chief, Engineering Services, is Assistant State Highway Engineer J. C. Dingwall. Dingwall's deputy is John A. Waller, Chief Engineer of Maintenance Operations. It is Waller's Division that bears specific responsibility as appointed by Greer for Departmental representation on disaster matters. The different duties are carried out by division personnel, including J. A. Shelby (Engineer V), the assistant deputy and liaison officer. Three alternate liaison officers are: Roger Spencer (Engineer V), M. U. Ferrari (Engineer III), and Sam Roper (Engineer IV).

Other personnel from Austin assisting in disaster and emergency actions include Robert R. Guinn (Engineering Assistant III), Julius Donnell Jr., and James E. Lewis (both Communications Superintendent III).

The Austin staff coordinates efforts of the Department with the state emergency headquarters. Local highway activities are supervised by the district offices. These district procedures are directed by the District Engineer and staff, who would act independently during disaster and nuclear attack, although maintaining contact with the Austin staff.

It is in the districts that post-attack man-power needs of the Highway Department will be tabulated. Each district will be given a disaster rating classification or function during the emergency and recovery period which follows.

There are four such area classifications—strike, fall-out, reception and care, and support areas. Each of the 25 districts would be placed into one or possibly two of these categories. Manpower requirements would be based on functions of the Department within the area classification.

Let's consider each area.

In the strike area, either evacuation or taking cover will hold sway, depending on the time lapse between the initial warning and detonation. If evacuation is ordered by civil defense authorities, the Department's main function here would be to keep routes open to traffic. It would do so by maintaining roads and bridges, clearing stalled vehicles, erecting signs, establishing traffic control stations and regulating posts, and maintaining radio communications along evacuation routes. The Department would also move essential construction equipment to an anticipated safe area. These operations could be accomplished with reasonable effectiveness by the efficient use of Highway Department man power in districts concerned. However, a distribution of man power between districts may be found desirable to perform the additional duties required in radiological monitoring of evacuation routes, sign placement, barricade installation, and debris clearance.

Activities within a fall-out area would somewhat parallel those of a strike area where sufficient advance warning is given.

The third classification to consider, a reception and care area, would necessarily require additional man power to cope with the expected influx of evacuees from strike or fall-out areas. However, alleviating this requirement somewhat will be district personnel from these very areas and supplementary help from support areas.

Although some of the designated duties for this third category duplicate those of previously mentioned classifications, there are some differences. There would be a need for construction of new roads and streets at reception centers, the installation of utilities, including water supply, housing, sanitation, and other needed facilities. Maintaining radio communi-

cations along priority routes and at reception centers is another important function.

To furnish man power and equipment to areas needing assistance, districts within a support area would maintain local responsibilities with a reduced force. This includes assisting health, medical, welfare, and other state agencies in engineering and construction needs to maintain traffic. When radiation has decayed to a safe level in damaged areas, crews will also clear debris and repair highways, and may provide engineering assistance to other agencies in the repair and replacement of facilities.

"Generally, man-power requirements in all areas will depend upon the magnitude and scope of the disaster, and will be fulfilled throughout the state by movement of an effective number of personnel from regular duties to emergency duty," says Ferrari, who works closely with the disaster programs.

Ferrari, along with the other alternate liaison officers, represents the Texas Highway Department on an emergency council consisting of representatives of nine other state agencies. The council, which has been meeting in the control center of the Department of Public Safety in Austin, gives the various agencies opportunity to test their effectiveness under simulated nuclear attack once a year. The test: "Operation Alert."

What are the duties of the Texas Highway Department representatives in "Operation Alert"—duties which would be duplicated under disaster or nuclear attack?

"We work with the other state agencies in the solution of state-wide disaster problems, providing engineering assistance as requested, coordinating and assisting the efforts of the highway districts in emergency activities, maintaining lists of highway equipment available for distribution to areas where needed, and charting priority routes for essential traffic movements," explains Ferrari. "Direct communication between the control center and the Department allows immediate adoption of any operation called for by disaster districts scattered throughout the state."

Besides involvement in the preceding programs, personnel from the Texas Highway Department participate in what is perhaps one of the most important of all safety procedures: the monitoring of highways for radiological fall-out. It is the purpose of this program, initiated by the Department last year, to provide for the safe movement of traffic on Texas highways in nuclear or domestic disaster without fear of entering areas that are dangerously radioactive. This also holds true when radioactive materials become involved in highway mishaps, an occasional occurrence.

To implement the program, 125 maintenance men throughout the districts—men who are thoroughly familiar with the highway networks in their areas—have been trained in detection work. Their findings regarding unsafe highway conditions would be reported and made available for plotting at the state control center and distribution to the public and press.

"This training has been instigated," says J. A. Shelby, "to fulfill our responsibility toward assurance of movement of highway traffic during disasters."

Another phase of Departmental involvement in a program designed to maintain a smooth flow of traffic at all times on Texas highways is the issuance of permits for overweight and oversized vehicles. Sharing this responsibility are O. F. Henderson, Assistant Chief Engineer of Maintenance Operations, B. J. Greer, Accountant III, Ferrari, and Guinn. All are with Maintenance Operations Division, Austin office.

According to Henderson, "The Southwestern Traffic Region of the Defense Traffic Management Service of Dallas has been authorized by the Department of Defense to request permits for oversize, overweight or other special military movements over Tex-

***Nearly every day Departmental personnel in the Austin Office or in the Districts issue permits for passage of missiles and other military equipment along Texas highways. Missiles, like the above, are transported in sections, sealed in pneumatic steel drums. This picture shows one missile intercepting another and the resulting explosion.***

***Military cargo was a familiar sight on Texas highways during World War II.***

as highways. Usually, the request is channeled from the government through the Southwestern Traffic Region in Dallas, to the Department. Approximately 250 such requests were received last year for the movement of oversize or overweight missiles, missile parts, or fixtures alone. Some of these moves are urgent and request that travel be continuous, including night, week end, holiday, and inclement weather. This is granted upon receipt of a telegram as a 'Certificate of Military Essentiality for these moves.' "

This movement, actually, is safeguarded by military personnel's scouting the designated route prior to movement, says Henderson, so that every precaution may be taken. If necessary, highway patrols escort a convoy or transport truck through traffic.

In keeping with the stepped-up transportation of oversized cargo, authorities now require that vertical clearance on the Interstate System be sixteen feet instead of fourteen feet.

This clearance is especially important with ever-increasing transportation of missiles on Texas highways. With NASA's acceptance of Houston as the site for an advanced space project, this activity should be compounded, although it has been brisk since there are already three missile defense areas in Texas. Their locations: Austin, Fort Worth-Dallas, and Abilene. Furthermore, missile sections, sealed in pneumatic steel drums, are constantly being trucked across Texas to Cape Canaveral and other points.

A typical missile moved by the Army—a Nike Hercules—to these areas on Texas highways will be on display in Austin, May 19-20, as part of Armed Services day. Appropriately enough, this coincides with the opening of National Highway Week, May 20, to be a fitting reminder of one of the most important usages of our Texas highways— the military movement of troops, supplies, and equipment during peacetime, domestic disaster, and nuclear attack.

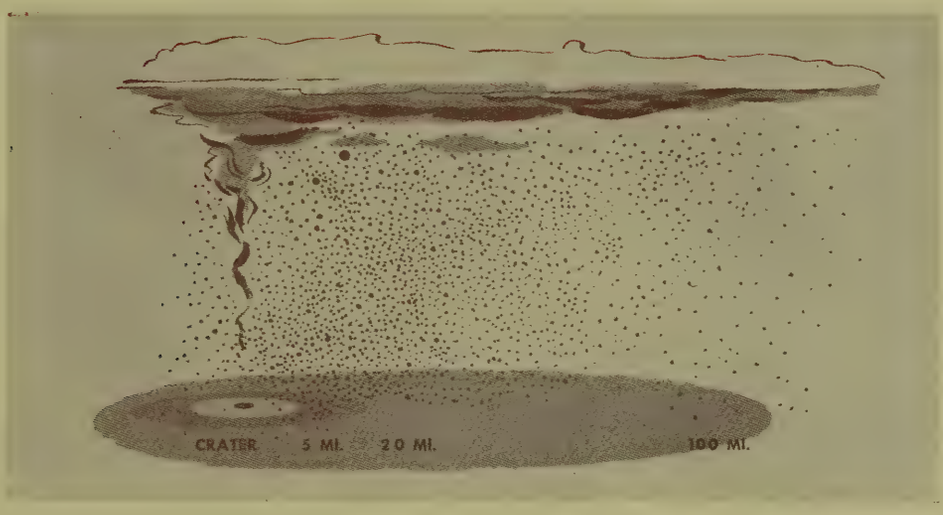
As D. K. Chacey, Chief of Transportation for Transportation Engineering, Department of the Army said recently, "The greatest benefit of the Interstate System to national defense is preparedness for an attack—and, of course, we hope we never have to receive this benefit."

***. . . As were the convoys of trucks and troops which stretched for long distances.***

MAY 20-26
HIGHWAY WEEK

**In compliance with requests from the federal government that each state employee be alerted to emergency preparedness procedures, personnel in Maintenance Operations Division, Austin Office, offer the following information on survival.**

# A CHANCE FOR SURVIVAL




The difference between life and death—that's what civil defense preparedness could mean to you. And this preparedness, so important to the perpetuation of mankind, gives new meaning to Charles Darwin's theory of the "survival of the fittest." For the "fittest" will surely be the best prepared.

Pushing this preparedness on all levels is a myriad of material, the most important for the individual perhaps being "Fallout Protection," a Department of Defense publication detailing what each person should know and do about the nuclear threat. The booklet, obtainable at any post office, local civil defense agency, or the state civil defense office in Austin, is free and well worth having.

Forewarns the Defense Department in the first few pages of the booklet, "There are no total answers, no easy answers, no cheap answers to the question of protection from nuclear attack. But there *are* answers. Some of them are in this booklet."

Though not professing to be a complete panacea for protection, the publication does help the individual plan for the initial two-week post attack personal survival period. This is the period during which authorities say the individual will be more or less on his own, so preparedness is essential. By studying "Fallout Protection," each person will learn about many things, including nuclear weapons, radiation effects, fall-out, radiation

meters, decontamination, first aid, emergency food, water, and sanitation.

He will also learn about the different kinds of shelters available at varying costs. According to existing information, shelters are the key to preservation of our civilization against thermonuclear devastation.

Said President Kennedy in 1961, "In the event of attack, the lives of those families which are not hit in the nuclear blast and fire can still be saved if they can be warned to take shelter and if that shelter is available. We owe that kind of insurance to our families and to our country."

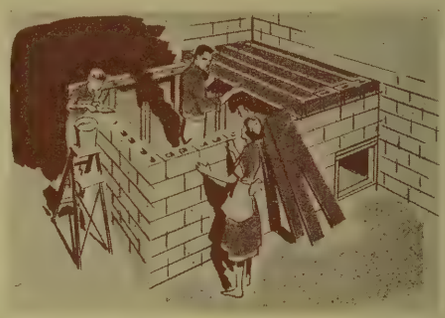
Shelters mean insurance, explains the booklet, by providing protection against radioactive fallout which would spread beyond areas of direct nuclear effects. In fact, under large-scale attack any point in the United States could be contaminated and subjected to varying levels of fall-out. Quite naturally, blast and heat from a strike could be widespread, although there would be great variations in the amount and degree of devastation with many areas escaping such damage.

Seeking shelter should be upmost in every individual's mind if warning is sounded before a strike occurs and evacuation is not recommended by authorities. There may be a one-hour grace period after detonation before fall-out becomes dangerous. If the only warning is the appearance of a fire ball, take cover immediately, shelter or not, by improvising. For instance, a motorist should stop the car, crouch down on the floor as low as possible, with arms shielding the head from flying glass and debris. A culvert, ditch, underpass, or the like will afford some protection to the pedestrian out of building reach. Those within buildings should keep away from windows, putting as much material mass as possible between themselves and radioactive particles which have settled on the roof, ground, and other horizontal surfaces. Proper shelter should be sought by those in improvised refuges during the grace period previously mentioned.

Once within a shelter, individuals should remain there until it is determined that their immediate area is free from serious radiation or contamination. This period will be approximately two weeks in duration, depending upon such variables as nearness of the strike, initial radiation level, and changes in wind direction. To insure reception of news and other communications, a battery-powered radio will be needed.

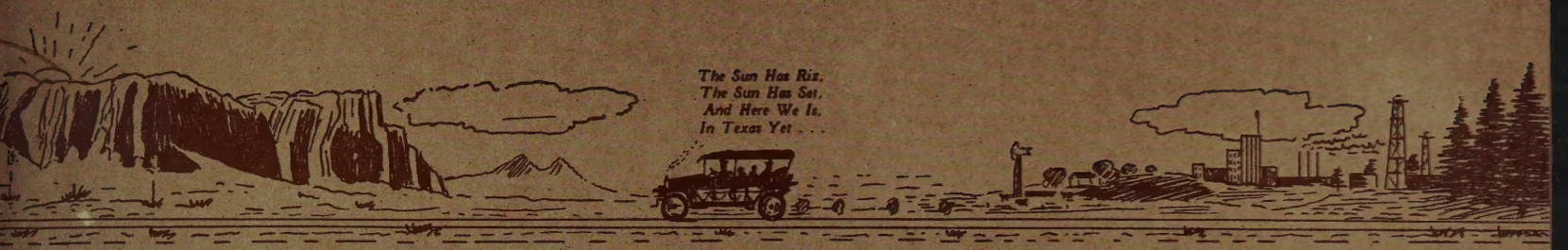
Throughout the emergency, activities will be coordinated by state and local civil-defense organizations, as specified by the National Civil Defense Plan. This extensive, well-organized document outlines government procedures to be followed during emergencies and establishes responsibility for the individual, local, state, and federal governments in the recovery program. It is in this plan that individuals are directed to exist on personal supplies for the two-week post-attack period. According to the plan, cities, counties, and states must exist on consumer items and essential equipment immediately available to their respective jurisdictions for a minimum of four weeks following attack. After this period, federal stockpiles and other resources available to the federal government for survival purposes will be allocated to states on the basis of need.

Another carefully devised plan dedicated to the continuation of state government under emergency conditions is our own Texas Operational Survival Plan. It is composed of four volumes with annexes.



Implementation of any plans and the continuity of state and federal governments depend primarily upon survival of the individual, which makes individual preparedness—first aid and civil defense training, shelter construction, supply stockage, and the like—vital to the recovery of the community and country.

When a family's safety is assured and radiation decays to a safe level outside the shelter, each Highway Department employee should report to his regular office for assignment. He should do so because after attack and during recovery, Highway Department personnel will be near the top of essential man power required to re-establish our normal way of life. In the event that an employee's local office is inactive due to damage, the employee should report to the nearest active office. There he will be told how to assist in the reconstruction and maintenance of highways and bridges and in surveying highways for radiological fall-out to insure the safe movement of traffic during the emergency.




# OVER THE HIGHWAYS

## Comments . . . from the Traveling Public

• Enclosed is a card [survey card from Highway Tourist Bureau] we received from a gentleman who has been placed on a job where he fits perfectly.

In addition to returning the card we wish to bring to your attention how much we appreciate the use of your beautiful roadside rest areas, also the fact that we stopped at a roadside rest area in Kenney (sic) County. Soon after we stopped a County Highway car pulled alongside of us. We were asked if we and our auto were o.k., was there anything that could be done to make our visit to Texas more pleasant. I asked the gentleman's name, he stated it was Mr. Aires, if it is possible for you to do so, will you kindly let him know that we did appreciate the attention given us. [Ed. Note: There is a James C. Ayres who is Maintenance Construction Foreman at Brackettville.]

The spelling of the name of the county and the gentleman who was so nice to us may not be correct, but we do hope this information will enable you to identify the employee and for you to understand our appreciation.

Fred S. Galloway
Port Charlotte, Florida

• Your tourist bureau service is wonderful. We really did appreciate it. Thanks.

Pete Henderson
Malvern, Arkansas

• On Tuesday of last week I was compelled to go to Austin and, of course, there was no way to go except by car. The weather was very bad and the road conditions were very bad.

I left Lufkin very early in the morning and I followed my usual route over 103, State Highway No. 21 to Bastrop and then to Austin.

You know that I still check on all of our Highways just the same as when I was chairman of the Commission.

I want to tell you how proud I was of the Department because the maintenance crews had everything under control. The roads were well marked as to icy conditions and the bridges had either sand or gravel surface. The men were out early and were really taking care of the traffic. Working conditions were as bad as they could be. I wonder how many people of Texas realize that our maintenance men were on the job.

I just wanted to tell you and your Engineers who are charged with the responsibility of these roads how thankful I was for an efficient Highway Department.

John S. Redditt
Lufkin, Texas

• I just want to say "congratulations" on your State. We are service people and we travel quite a bit. One thing in Texas in particular is why I'm writing, and that is your roadside parks. Never have we seen any kept as nice as the ones there.

Carolyn Little
San Diego, California

• In traveling over Texas, we have found your map superior, and far more attractive and informative than any other map we've used. The photography is excellent and the presentation of information makes us want to see more of it, and often.

You are to be congratulated on the results of your efforts to impress the public with the wonders of our great State of Texas.

Mrs. Lester A. Coon
Tyler, Texas

• Recently I received a reply to my request for information from your office, and I would like to tell you how pleased I was to get the maps, pamphlets, etc., which were enclosed.

I have already shown them to friends and they were impressed by all of the items which you were kind enough to send, and it is in this regard that I wanted to write to you again to offer my thanks. May I say that your willingness to help me as you did is proof enough that the stories about the friendliness of Americans has not been exaggerated.

Eberhard Stotzel
Dillenburg/Hessen
West Germany

# To and From Our Readers

Former Highway Commission member Robt. J. Potts passed away on April 18.

Potts, instrumental in the good-roads movement which resulted in the founding of the Texas Highway Department in 1917, served on the Highway Commission from 1949 to 1955.

Born near Weatherford, Potts held two degrees in engineering from A. & M College. He served for several years as professor of highway engineering at that institution.

Potts was a member of the Episcopal Church, American Society of Civil Engineers, Masons, and Rotary Club.

He is survived by his wife, of Austin, and two sons.

### From Green to Tan

Part of the May projects will be let under the brand-new "Tan Book." It will probably be June or July before all projects are let under the new book. Districts received their initial supply of the specifications book in March.

### Hydraulic Manual

Bridge Division has updated its Hydraulic Manual. Their Storm Sewer Design Manual, prepared by H. W. Kessler of Bridge Division has been included in the new Hydraulic Manual.

The first Hydraulic Manual, originated in District 12 by then District Engineer W. J. Van London, was published in 1944.

### About Our Pictures . . .

The proclamation on the front cover this month establishes May 20-26 as Highway Week in Texas. For more information on Highway Week, see story, page. 3.

Inside the front cover, symbolizing today's modern highway design, is the interchange of Eastex Freeway and Loop 137 in Houston.

Photographers have been quick to note the Central Texas Highway sign pictured inside the back cover since the Friendship 7 spaceship carried our astronaut into orbit.


**TEXAS HIGHWAY COMMISSION**

| | |
|---|---|
| HERBERT C. PETRY JR. | Chairman |
| CHARLES F. HAWN | Member |
| HAL WOODWARD | Member |
| D. C. GREER | State Highway Engineer |

"SOMETIMES I THINK YOURE THE REASON THEY PUT THIS SIGN UP!"


## Texas Highways

TEXAS HIGHWAYS, official journal of the Texas Highway Department, is published in the interest of highway development in Texas and for departmental education in the improvement of construction, maintenance, and operation.

TEXAS HIGHWAYS is available to the general public on a subscription basis at $3.50 annually, or it can be purchased for 35 cents a copy. Subscriptions, inquiries, material, or manuscripts should be directed to the Editorial Office, Travel and Information Division, Texas Highway Department, Austin 14, Texas.

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